GS1 Series Introduction

GS1 Series Drives					
Motor Rating	**Hp**	**.25**	**.5**	**1**	**2**
	kW	**0.2**	**0.4**	**0.75**	**1.5**
115 Volt Single Phase Input/230 Volt Three Phase Output		✔	✔		
230 Volt Single Phase Input/230 Volt Three Phase Output		✔	✔	✔	
230 Volt Three Phase Input/Output					✔

Overview

The GS1 series of AC drives is our most affordable and compact inverter, offering V/Hz control with general purpose application features. These drives can be configured using the built-in digital keypad (which also allows you to set the drive speed, start and stop, and monitor specific parameters) or with the standard RS-485 serial communications port. Standard GS1 features include one analog input, four programmable digital inputs and one programmable normally open relay output.

Features

- Simple Volts/Hertz control
- Pulse Width Modulation (PWM)
- 3 - 10 kHz carrier frequency
- IGBT technology
- 130% starting torque at 5Hz
- 150% rated current for one minute
- Electronic overload protection
- Stall prevention
- Adjustable accel and decel ramps
- S-curve settings for acceleration and deceleration
- Automatic torque compensation
- Automatic slip compensation
- DC braking
- Built-in EMI filter
- Three skip frequencies
- Trip history
- Integral keypad and speed potentiometer
- Programmable jog speed
- Three programmable preset speeds
- Four programmable digital inputs
- One programmable analog input
- One programmable relay output
- RS-485 Modbus communications up to 19.2K
- Optional Ethernet communications
- UL/CE listed

Accessories

- AC line reactors
- RF filter
- Ethernet interface
- Four and eight port RS-485 multi-drop termination board
- KEP*Direct* I/O Server
- GSoft drive configuration software

Detailed descriptions and specifications for the accessories are available in the "GS/DURAPULSE Accessories" section.

Typical Applications

- Conveyors
- Fans
- Pumps
- Shop tools

GS1 series part numbering system

GS1 - 2 0P5

Applicable Motor Capacity
0P2: 1/4hp   0P5: 1/2hp
1P0: 1hp   2P0: 2hp

Input Voltage
1: 100-120VAC
2: 200-240VAC

Series Name

GS1 Series Specifications

115V/230V CLASS GS1 Series							
Model		GS1-10P2	GS1-10P5	GS1-20P2	GS1-20P5	GS1-21P0	GS1-22P0
Motor Rating	HP	1/4 hp	1/2 hp	1/4 hp	1/2 hp	1hp	2hp
	kW	0.2 kW	0.4 kW	0.2 kW	0.4 kW	0.7 kW	1.5 kW
Rated Output Capacity (200V) kVA		0.6	1.0	0.6	1.0	1.6	2.7
Rated Input Voltage		Single phase 100-120 VAC ±10%, 50/60 Hz ±5%		Single/three phase: 200-240 VAC±10%, 50/60 Hz ±5%			Three phase: 200-240 VAC±10%, 50/60 Hz ±5%
Rated Output Voltage		Three phase corresponds to double the input voltage		Three phase corresponds to the input voltage			
Rated Input Current (A)		6	9	4.9/1.9	6.5/2.7	9.7/5.1	9
Rated Output Current (A)		1.6	2.5	1.6	2.5	4.2	7.0
Watt Loss 100% (I)		19.2	19.2	18.4	26.8	44.6	73
Weight: kg (lb)		2.10	2.20	2.20	2.20	2.20	2.20
Dimensions (HxWxD) mm (in)		132.0 x 68.0 x128.1 (5.20 x 2.68 x 5.04)					
Accessories							
Ethernet Communications module for GS Series Drives (DIN rail mounted)		GS-EDRV					
Four port RS-485 multi-drop termination board		GS-RS485-4					
Eight port RS-485 multi-drop termination board		GS-RS485-8					
Software		GSoft / KEP*Direct*					
OPC Server		KEP*Direct*					

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

TB's & Wiring

Power

Enclosures

Appendix

Part Index

GS1 General Specifications

General Specifications			
Control Characteristics			
Control System			Sinusoidal Pulse Width Modulation, carrier frequency 3kHz - 10kHz
Rated Output Frequency			1.0 to 400.0 Hz limited to 9999 motor rpm
Output Frequency Resolution			0.1 Hz
Overload Capacity			150% of rated current for 1 minute
Torque Characteristics			Includes auto-torque, auto-slip compensation, starting torque 130% @ 5.0Hz
DC Braking			Operation frequency 60-0Hz, 0-30% rated voltage. Start time 0.0-5.0 seconds. Stop time 0.0-25.0 seconds
Acceleration/Deceleration Time			0.1 to 600 seconds (can be set individually)
Voltage/Frequency Pattern			V/F pattern adjustable. Settings available for Constant Torque - low and high starting torque, Variable Torque - low and high starting torque, and user configured
Stall Prevention Level			20 to 200% or rated current
Operation Specification			
Inputs	**Frequency Setting**	**Keypad**	Setting by <UP> or <DOWN> buttons or potentiometer
		External Signal	Potentiometer - 5kΩ 0.5W, 0 to 10 VDC (input impedance 47kΩ), 0 to 20 mA / 4 to 20 mA (input impedance 250Ω), Multi-function inputs 1 to 3 (3 steps, JOG, UP/DOWN command), RS485 communication setting
	Operation Setting	**Keypad**	Setting by <RUN>, <STOP> buttons
		External Signal	DI1, DI2, DI3, DI4 can be combined to offer various modes of operation, RS485 communication port
Outputs	**Multi-Function Input Signal**		Multi-step selection 0 to 3, Jog, Accel/decel inhibit, First/second accel/decel switch, Counter, PLC operation, External base block (N.C., N.O.) selection
	Multi-Function Output Signal		AC drive operating, Frequency attained, Non zero speed, Base Block, Fault indication, Local/remote indication, PLC operation indication
	Operating Functions		Automatic voltage regulation, S-curve, Over-voltage stall prevention, DC braking, Fault records, Adjustable carried frequency, Starting frequency setting of DC braking, Over-current stall prevention, Momentary power loss restart, Reverse inhibition, Frequency limits, Parameter lock/reset
Protective Functions			Overcurrent, overvoltage, undervoltage, electronic thermal motor overload, Overheating, Overload, Self testing
Operator Interface	**Operator Devices**		5-key, 4-digit, 7-segment LED, 3 status LEDs, potentiometer
	Programming		Parameter values for setup and review, fault codes
	Parameter Monitor		Master Frequency, Output Frequency, Scaled Output Frequency, Output Voltage, DC Bus Voltage, Output Direction, Trip Event Monitor, Trip History Monitor
	Key Functions		RUN/STOP, DISPLAY/RESET, PROGRAM/ENTER, <UP>, <DOWN>
Environment	**Enclosure Rating**		Protected chassis, IP20
	Ambient Operating Temperature		-10° to 40°C (14°F to 104°F) w/o derating
	Storage Temperature		-20° to 60 °C (-4°F to 140°F) during short-term transportation period)
	Ambient Humidity		0 to 90% RH (non-condensing)
	Vibration		9.8 m/s^2(1G), less than 10Hz. 5.88 m/s^2 (0.6G) 20 to 50 Hz
	Installation Location		Altitude 1000m or lower above sea level, keep from corrosive gas, liquid and dust
Options			Programming Software (GSOFT)

GS1 Specifications - Installation

Understanding the installation requirements for your GS1 drive will help to ensure that it will operate within its environmental and electrical limits.

NOTE:
Never use only this catalog for installation instructions or operation of equipment; refer to the user manual, GS1-M.

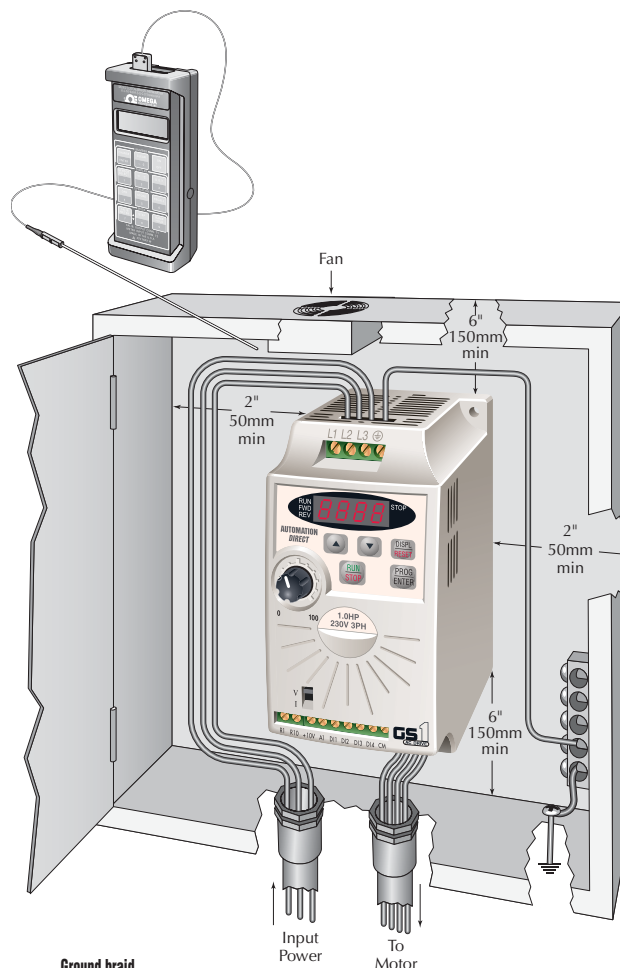| Environmental Specifications	
Protective Structure	IP20
Ambient Operating Temperature [2]	-10 to 40°C
Storage Temperature [3]	-20 to 60°C
Humidity	to 90% (no condensation)
Vibration [4]	5.9 m/S² (0.6G), 10 to 55 Hz
Location	Altitude 1,000 m or less, indoors (no corrosive gases or dust)

1: Protective structure is based upon EN60529

2: The ambient temperature must be in the range of -10° to 40° C. If the range will be up to 50° C, you will need to set the carrier frequency to 2.1 kHz or less and derate the output current to 80% or less. See our Web site for derating curves.

3: The storage temperature refers to the short-term temperature during transport.

4: Conforms to the test method specified in JIS CO911 (1984)

Watt-loss Chart	
GS1 Drive Model	**At full load**
GS1-10P2	19.2
GS1-10P5	19.2
GS1-20P2	18.4
GS1-20P5	26.8
GS1-21P0	44.6
GS1-22P0	73

Fan

6" 150mm min

2" 50mm min

2" 50mm min

6" 150mm min

Input Power

To Motor

Panel

Ground braid copper lugs

Star washers*

Panel or single point ground*
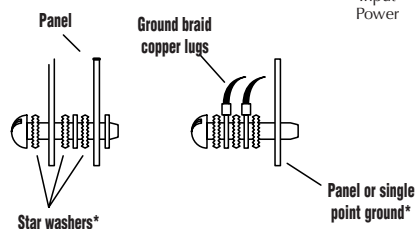
* FOR PAINTED SUB-PANELS, SCRAPE THE PAINT FROM UNDERNEATH THE STAR WASHERS BEFORE TIGHTENING THEM.

Air Flow

Warning: AC drives generate a large amount of heat, which may damage the AC drive. Auxiliary cooling methods are typically required in order to not exceed maximum ambient temperatures.

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

Software

C-more HMIs

Other HMI

AC Drives

Motors

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Pushbuttons/ Lights
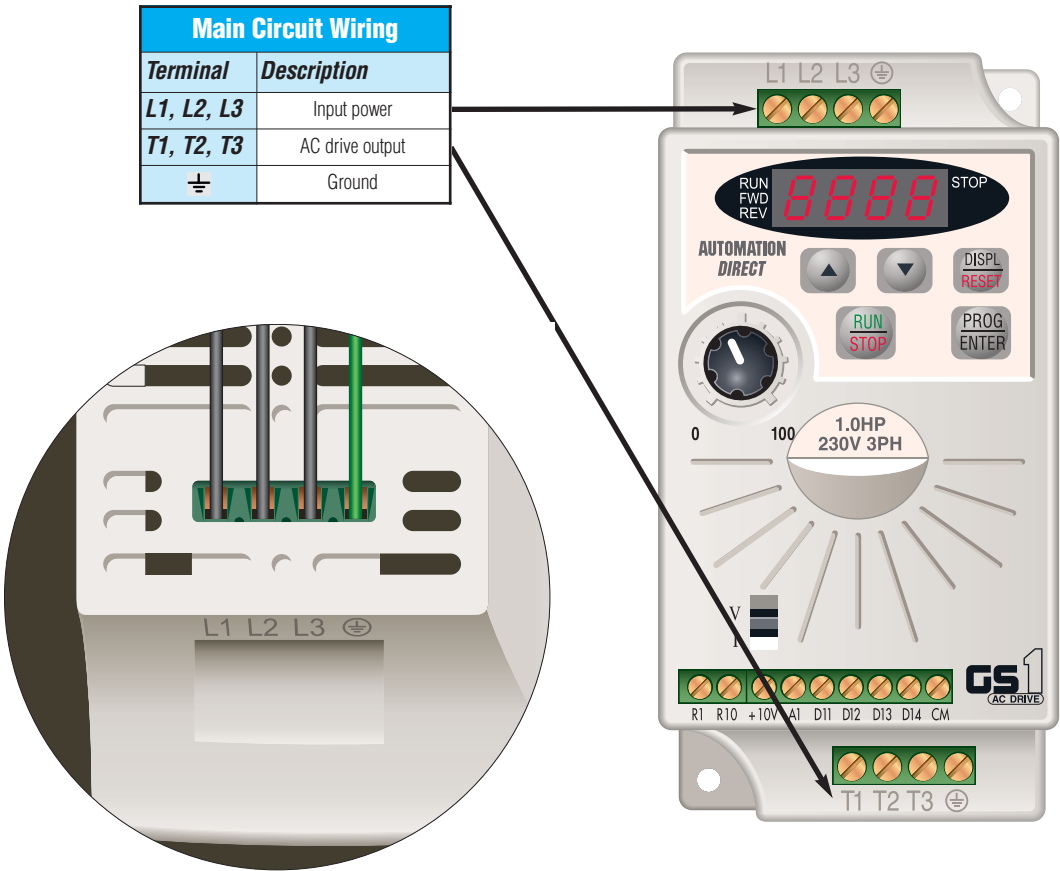
Process

Relays/ Timers

Comm.

TB's & Wiring

Power

Enclosures

Appendix

Part Index

GS1 Specifications - Terminals

Main Circuit Wiring	
Terminal	**Description**
L1, L2, L3	Input power
T1, T2, T3	AC drive output
⏚	Ground

Control Circuit Terminals	
Terminal Symbol	**Description**
R1O	Relay output 1 normally open
R1	Relay output 1 common
DI1	Digital input 1
DI2	Digital input 2
DI3	Digital input 3
DI4	Digital input 4
AI [1]	Analog input
+10V	Internal power supply (10 mA @ 10 VDC)
CM	Common

[1] *0 to +10 VDC, 0 to 20 mA, or 4 to 20 mA input represents zero to maximum output frequency.*

Note: Use twisted-shielded, twisted-pair or shielded-lead wires for the control signal wiring. It is recommended all signal wiring be run in a separate steel conduit. The shield wire should only be connected at the drive. Do not connect shield wire on both ends.

GS1 Specifications - Basic Wiring Diagram

Note: Users MUST connect wiring according to the circuit diagram shown below. (Refer to user manual GS1-M for additional specific wiring information.)
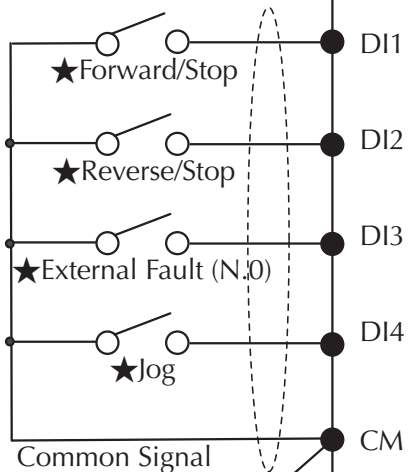
Note: Refer to the following pages for explanations and information regarding line reactors and RF filters: 12–50, 12–67.

Power Source 3 phase*

100-120V±10%
(50/60Hz ±5%)

200-240V±10%
(50/60Hz±5%)

GS1-xxxx

L1
L2
L3

T1
T2
T3

AC Motor

IM

* Use terminals L1 and L2 for 120V, or select any two of the power terminals for 240V single phase models
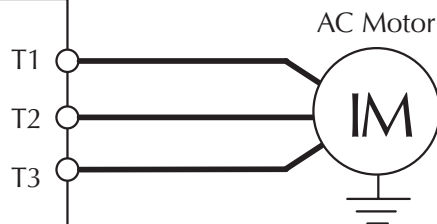
Grounding resistance less than 0.1Ω

★Forward/Stop — DI1

★Reverse/Stop — DI2

★External Fault (N.O) — DI3

★Jog — DI4

Common Signal — CM

Multi-function output contacts
120VAC/24VDC @5A
230VAC @2.5A

R1O
R1

★Fault Indication

RJ-12 (6P4C)
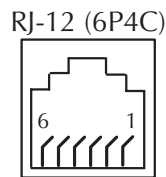
RJ-12 Serial Comm Port

RS-485
2: GND
3: SG-
4: SG+
5: +5V

Communication Port

Analog voltage 0-10VDC

Potentiometer 3~5kΩ

Analog current 0-20mA; 4-20mA

+10V 10mA (max)

AI   ★★
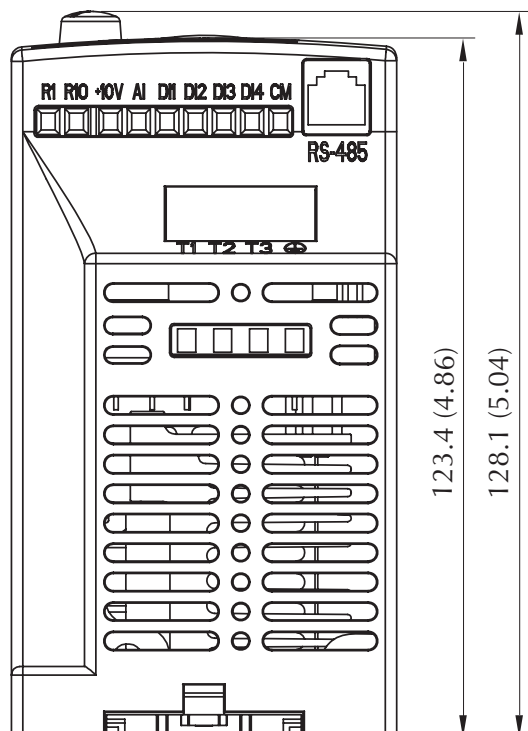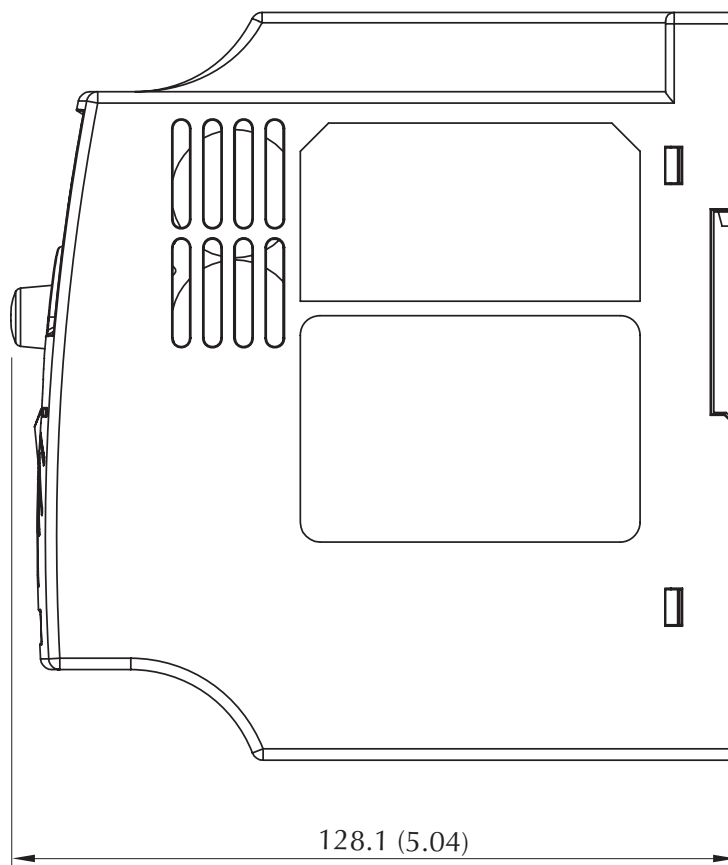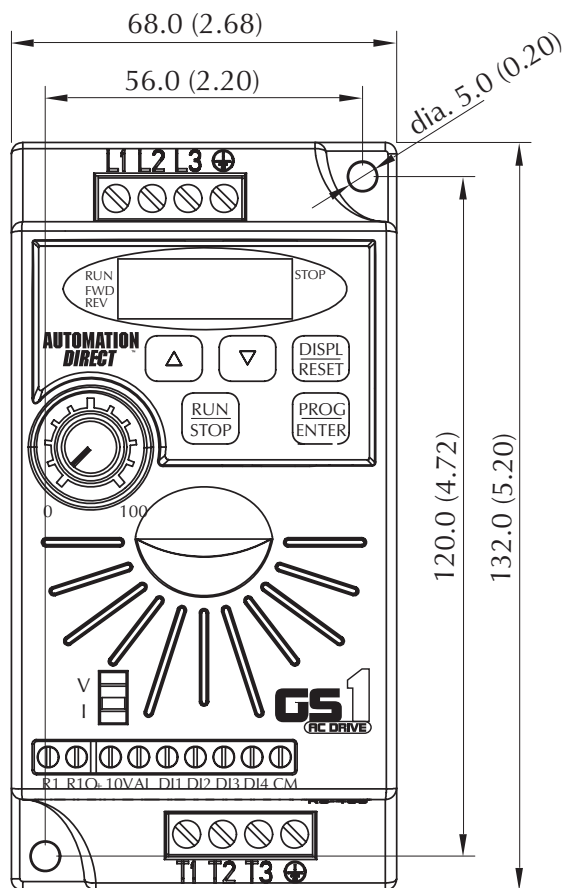
CM

★Factory default setting

★★Factory default source of frequency command is via the keypad potentiometer

○ Main circuit (power) terminals   ● Control circuit terminal   ⌁ Shielded leads

⚠ WARNING: Do not plug a modem or telephone into the GS1 RJ-12 Serial Comm Port, or permanent damage may result. Terminals 2 and 5 should not be used as a power source for your communication connection.
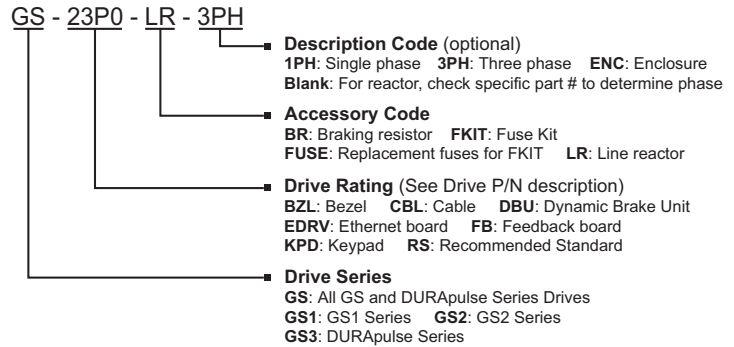
GS1 Specifications - Dimensions

68.0 (2.68)

56.0 (2.20)

dia. 5.0 (0.20)

L1 L2 L3

RUN
FWD
REV

STOP

AUTOMATION
DIRECT

△   ▽   DISPL
RESET

RUN
STOP   PROG
ENTER

0   100

V
I

GS1
AC DRIVE

R1 R1O +10V AI DI1 DI2 DI3 DI4 CM

T1 T2 T3

120.0 (4.72)

132.0 (5.20)

128.1 (5.04)

R1 R1O +10V AI DI1 DI2 DI3 DI4 CM

RS-485

T1 T2 T3

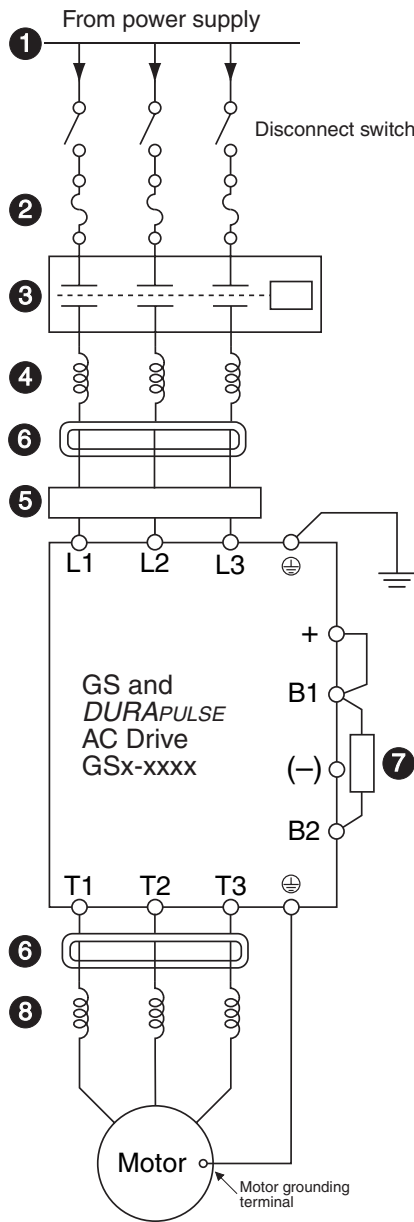123.4 (4.86)

128.1 (5.04)

Unit: mm (in)

GS/*DURAPULSE* Accessories – Overview

Accessories part numbering system

Note: With the exception of the EMI filters and RF filters, each accessory part number begins with GS, followed by the AC Drive rating, and then the relevant accessory code. Following the accessory code, you will find a description code when applicable. The diagram at right shows the accessory part numbering system.

GS - 23P0 - LR - 3PH

Description Code (optional)
1PH: Single phase   **3PH**: Three phase   **ENC**: Enclosure
Blank: For reactor, check specific part # to determine phase

Accessory Code
BR: Braking resistor   **FKIT**: Fuse Kit
FUSE: Replacement fuses for FKIT   **LR**: Line reactor

Drive Rating (See Drive P/N description)
BZL: Bezel   **CBL**: Cable   **DBU**: Dynamic Brake Unit
EDRV: Ethernet board   **FB**: Feedback board
KPD: Keypad   **RS**: Recommended Standard

Drive Series
GS: All GS and DURApulse Series Drives
GS1: GS1 Series   **GS2**: GS2 Series
GS3: DURApulse Series

Under 20hp

❶ Power Supply

Please follow the specific power supply requirements shown in Chapter 1 and the Warning section of the applicable GS or *DURAPULSE* AC Drives User Manual.

❷ Fuses (Refer to page 12–68.)

Input fuses protect the AC drive from excessive input current due to line surges, short circuits, and ground faults. They are recommended for all installations and may be required for UL-listed installations. *(AutomationDirect fuses are not available for GS1 drives.)*

❸ Contactor (Optional) (Refer to the Motor Controls section.)

Do not use a contactor or disconnect switch for run/stop control of the AC drive and motor. This will reduce the operating life cycle of the AC drive. Cycling a power circuit switching device while the AC drive is in run mode should be done only in emergency situations.

❹ Input Line Reactor (Optional) (Refer to page 12–50.)

Input line reactors protect the AC drive from transient overvoltage conditions, typically caused by utility capacitor switching. The input line reactor also reduces the harmonics associated with AC drives. Input line reactors are recommended for all installations.

❺ EMI filter (Optional) (Refer to page 12–61.)

Input EMI filters reduce electromagnetic interference or noise on the input side of the AC drive. They are required for CE compliance and recommended for installations prone to or sensitive to electromagnetic interference. *(Separate EMI filters are not neccessary for GS1 drives.)*

❻ RF filter (Optional) (Refer to page 12–67.)

RF filters reduce the radio frequency interference or noise on the input or output side of the inverter.

❼ Braking Resistor (Optional) (Refer to page 12–56.)

Dynamic braking allows the AC drive to produce additional braking (stopping) torque. AC drives can typically produce between 15% & 20% braking torque without the addition of any external components. The addition of optional braking may be required for applications that require rapid deceleration or high inertia loads. *(Braking resistors are not available for GS1 drives.)*

❽ Output Line Reactor (Optional) (Refer to page 12–50.)

Output line reactors protect the motor insulation against AC drive short circuits and IGBT reflective wave damage, and also "smooth" the motor current waveform, allowing the motor to run cooler. They are **recommended for operating "non-inverter-duty" motors** and when the **length of wiring between the AC drive and motor exceeds 75 feet.**

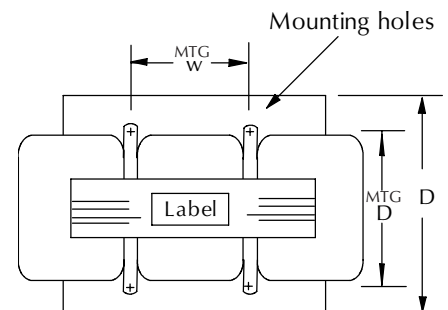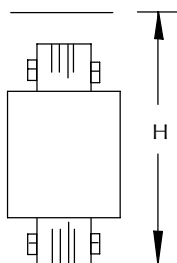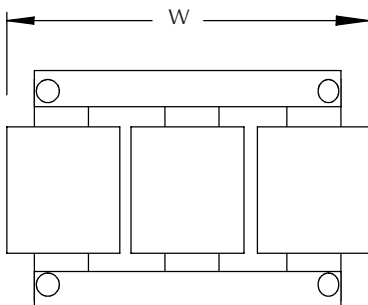# GS/*DURAPULSE* Drives Accessories – Line Reactors

115 Volt Single Phase Input Reactors

NOTE: Single phase line reactors should not be installed on the output of the AC Drive.

Part Number		Rated Amps	Impedance	Inductance	Watt Loss	Drive Model and Side / Phase / Volts	Drive hp
GS-10P2-LR		18	3%	0.80 mH	19	GS1-10P2 (input) / 1ph / 115V GS2-10P2 (input) / 1ph / 115V	0.25
GS-10P5-LR		25	3%	0.50 mH	23	GS1-10P5 (input) / 1ph / 115V GS2-10P5 (input) / 1ph / 115V	0.5
GS-11P0-LR		35	3%	0.40 mH	36	GS2-11P0 (input) / 1ph / 115V	1

230 Volt Single Phase Input Reactors

NOTE: Single phase line reactors should not be installed on the output of the AC Drive.

Part Number		Rated Amps	Impedance	Inductance	Watt Loss	Drive Model and Side / Phase / Volts	Drive hp
GS-20P5-LR-1PH		8	3%	6.50 mH	13	GS1-20P5 (input) / 1ph / 230V GS2-20P5 (input) / 1ph / 230V	0.5
GS-21P0-LR-1PH		12	3%	6.50 mH	13	GS1-21P0 (input) / 1ph / 230V GS2-21P0 (input) / 1ph / 230V	1
GS-22P0-LR-1PH		18	3%	3.00 mH	25	GS2-22P0 (input) / 1ph / 230V	2
GS-23P0-LR-1PH		35	3%	2.50 mH	26	GS2-23P0 (input) / 1ph / 230V	3

230 Volt Three Phase Input / Output Reactors

Part Number		Rated Amps	Impedance	Inductance	Watt Loss	Drive Model and Side / Phase / Volts	Drive hp
GS-20P5-LR-3PH		4	3%	6.50 mH	13	GS1-10P5 (output) / 3ph / 230V GS1-20P5 (in/out) / 3ph / 230V GS2-20P5 (in/out) / 3ph / 230V	0.5
GS-21P0-LR-3PH		4	3%	3.00 mH	7	GS1-21P0 (in/out) / 3ph / 230V GS2-21P0 (in/out) / 3ph / 230V GS3-21P0 (in/out) / 3ph / 230V	1
GS-22P0-LR-3PH		8	3%	1.50mH	11	GS1-22P0 (in/out) / 3ph / 230V GS2-22P0 (in/out) / 3ph / 230V GS3-22P0 (in/out) / 3ph / 230V	2
GS-23P0-LR-3PH		12	3%	1.30mH	23	GS2-23P0 (in/out) / 3ph / 230V GS3-23P0 (in/out) / 3ph / 230V	3
GS-25P0-LR		18	3%	0.80mH	19	GS2-25P0 (in/out) / 3ph / 230V GS3-25P0 (in/out) / 3ph / 230V	5
GS-27P5-LR		25	3%	0.50mH	23	GS2-27P5 (in/out) / 3ph / 230V GS3-27P5 (in/out) / 3ph / 230V	7.5
GS-2010-LR		35	3%	0.40mH	36	GS3-2010 (in/out) / 3ph / 230V	10
GS-2015-LR		45	3%	0.30mH	33	GS3-2015 (in/out) / 3ph / 230V	15
GS-2020-LR		55	3%	0.25mH	39	GS3-2020 (in/out) / 3ph / 230V	20
GS-2025-LR		80	3%	0.20mH	88	GS3-2025 (in/out) / 3ph / 230V	25
GS-2030-LR		80	3%	0.20mH	88	GS3-2030 (in/out) / 3ph / 230V	30
GS-2040-LR		130	3%	0.10mH	95	GS3-2040 (in/out) / 3ph / 230V	40
GS-2050-LR		130	3%	0.10mH	95	GS3-2050 (in/out) / 3ph / 230V	50

GS/*DURAPULSE* Drives Accessories – Line Reactors

Part Number	H	W	D	Mtg D	Mtg W	Mtg Slot Hole Size	Weight (lbs)
GS-10P2-LR	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.10
GS-10P5-LR	5.7	6.00	3.09	2.09	3.00	0.28 x 0.63	7.00
GS-11P0-LR	5.7	6.00	3.34	2.34	3.00	0.28 x 0.63	8.90
GS-20P5-LR-1PH	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.80
GS-20P5-LR-3PH	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.80
GS-21P0-LR-1PH	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.80
GS-21P0-LR-3PH	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.30
GS-22P0-LR-1PH	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	3.10
GS-22P0-LR-3PH	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	2.80
GS-23P0-LR-1PH	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.50
GS-23P0-LR-3PH	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	2.90
GS-25P0-LR	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.10
GS-27P5-LR	5.70	6.00	3.09	2.09	3.00	0.28 x 0.63	7.00
GS-2010-LR	5.70	6.00	3.34	2.34	3.00	0.28 x 0.63	9.00
GS-2015-LR	5.70	6.00	3.84	2.84	3.00	0.28 x 0.63	13.0
GS-2020-LR	5.70	6.00	3.84	2.84	3.00	0.28 x 0.63	12.0
GS-2025-LR	6.88	8.50	4.37	3.12	3.60	0.44 x 1.00	26.0
GS-2030-LR	6.88	8.50	4.37	3.12	3.60	0.44 x 1.00	26.0
GS-2040-LR	6.88	8.50	4.37	3.12	3.00	0.44 x 1.00	27.0
GS-2050-LR	6.88	8.50	4.37	3.12	3.00	0.44 x 1.00	27.0
GS-41P0-LR	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.30
GS-42P0-LR	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	2.80
GS-43P0-LR	3.40	4.40	3.39	2.39	2.00	0.28 x 0.63	4.30
GS-45P0-LR	3.40	4.40	2.83	1.77	2.00	0.28 x 0.63	3.10
GS-47P5-LR	4.80	6.00	3.30	2.09	2.00	0.28 x 0.63	7.50
GS-4010-LR	4.80	6.30	3.55	2.34	2.00	0.28 x 0.63	9.10
GS-4015-LR	5.70	6.00	3.34	2.34	3.00	0.28 x 0.63	10.0
GS-4020-LR	5.61	6.90	3.95	2.75	3.00	0.38 x 0.63	17.0
GS-4025-LR	5.61	6.90	3.95	2.75	3.00	0.38 x 0.63	17.0
GS-4030-LR	5.61	6.90	4.45	3.25	3.00	0.38 x 0.63	22.0
GS-4040-LR	6.88	8.50	4.37	3.12	3.00	0.44 x 1.00	26.0
GS-4050-LR	6.88	8.50	4.87	3.62	3.60	0.44 x 1.00	36.0
GS-4060-LR	6.88	8.50	4.87	3.62	3.60	0.44 x 1.00	36.0
GS-4075-LR	8.29	10.50	5.35	3.73	3.60	0.44 x 1.25	52.0
GS-4100-LR	8.29	10.50	5.35	3.73	3.60	0.44 x 1.25	41.0
GS-51P0-LR	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	3
GS-52P0-LR	3.40	4.40	2.83	1.77	1.44	0.28 x 0.63	3

GS/*DURAPULSE* Drives Accessories – Line Reactors

Input side of the drive

When installed on the input side of the AC drive, line reactors will reduce line notching, and limit current and voltage spikes and surges from the incoming line. The line reactor will also reduce harmonic distortion from the drive onto the line. Units are installed in front of the AC drive as shown.
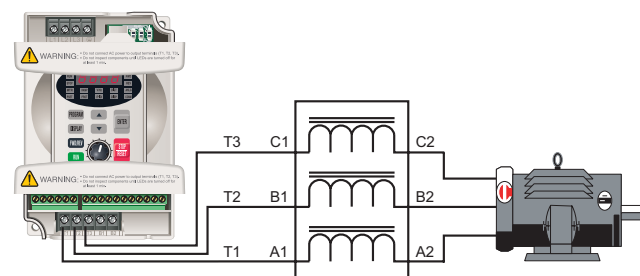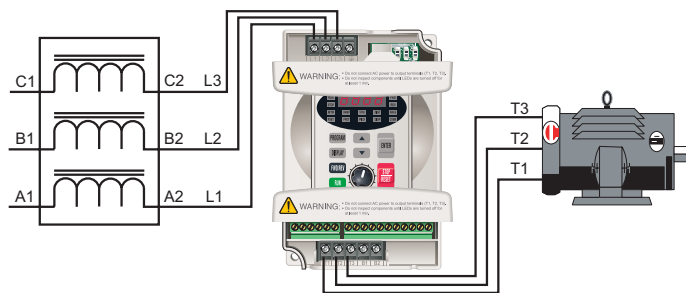
Output side of the drive

When installed on the output side of the drive, line reactors protect the drive from short circuits at the load. Voltage and current waveforms from the drive are enhanced, reducing motor overheating and noise emissions.

Note: Single phase line reactors should not be installed on the output of the AC Drive. Use three-phase only.

Multiple drives

Individual line reactors are recommended when installing multiple drives on the same power line. Individual line reactors eliminate cross talk between multiple drives and provide isolated protection for each drive for its own specific load.
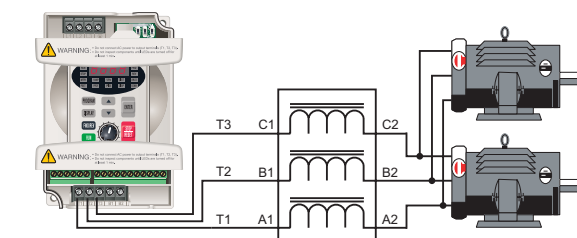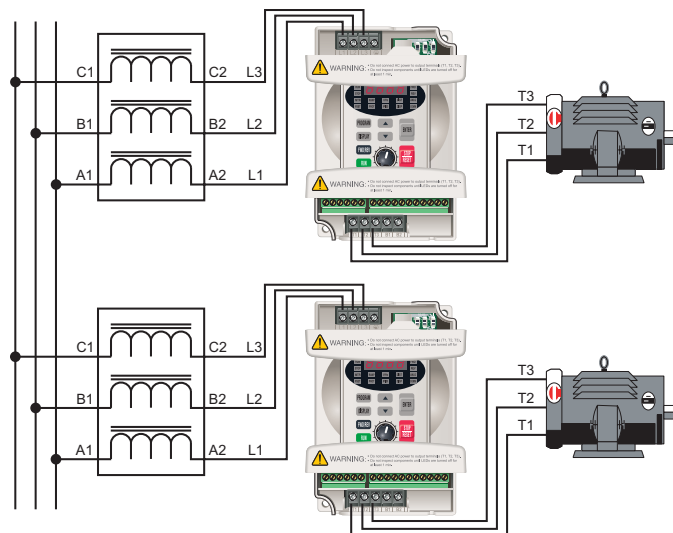
Multiple motors

A single reactor can be used when the application calls for multiple motors on the same drive. The reactor is sized based upon the total horsepower of all the motors. **Overload relays** (not shown) **are recommended** for use in multi-motor applications.
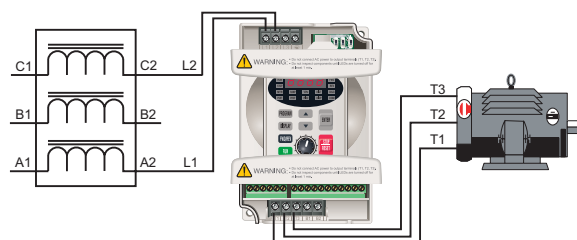
Note: A single reactor should only be used with multiple motors when the motors will always operate simultaneously.

Single phase applications

Some of the line reactors are listed for use with single-phase input power. Follow the connection diagram to the left. Make sure that terminals B1 and B2 are properly insulated before any connections are made.

⚠ **WARNING: Please ensure that terminals B1 and B2 are properly insulated before making any connections to single-phase power.**

PLC Overview

DL05/06 PLC

DL105 PLC

DL205 PLC

DL305 PLC

DL405 PLC

Field I/O

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C-more HMIs

Other HMI

AC Drives

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Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

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GS/*DURAPULSE* Accessories – RF Filter

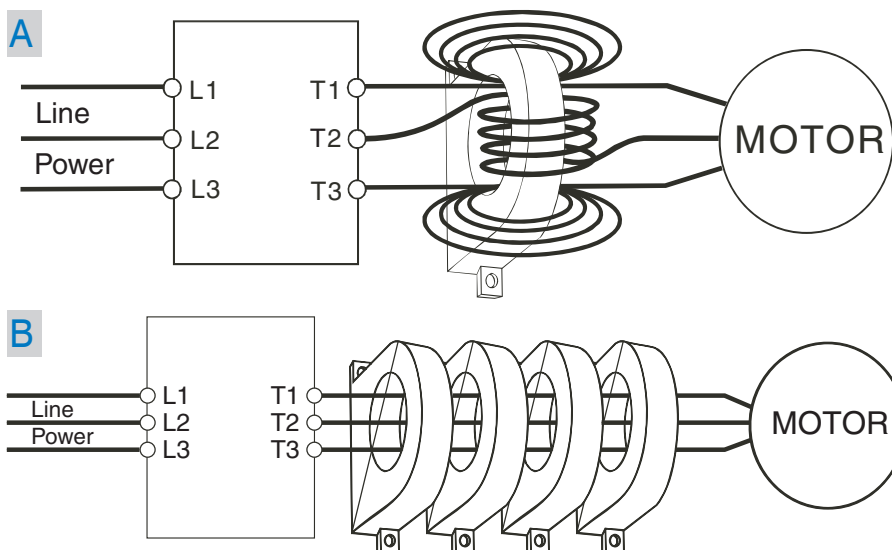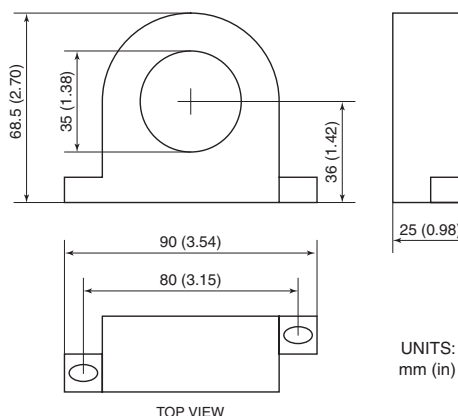| RF Filter for GS/*DURAPULSE* AC Drives		
Part Number		**Drive Model**
RF220X00A		GSx-xxxx
Can be used with all series GS/DURAPULSE AC drives		

Description

Zero phase reactors, (aka RF noise filters) help reduce radiated noise from the inverter wiring. The wiring must go through the opening to reduce the RF component of the electrical noise. Loop the wires three times (four turns) to attain the full RF filtering effect. For larger wire sizes, place multiple zero-phase reactors (up to four) side by side for a greater filtering effect. These are effective for noise reduction on both the input and output sides of the inverter. Attenuation quality is good in a wide range from AM band to 10 Mhz.

Wiring Method

Wind each wire four times around the core, as shown in diagram A to the right. The reactor must be put at inverter side as closely as possible.

If you are unable to wire as above due to wire size or another aspect of your application, put all wires through four cores in series without winding, as in diagram B to the right.

68.5 (2.70)
35 (1.38)
36 (1.42)
25 (0.98)
90 (3.54)
80 (3.15)

UNITS: mm (in)

TOP VIEW

A

Line Power — L1, L2, L3 — T1, T2, T3 — MOTOR

B

Line Power — L1, L2, L3 — T1, T2, T3 — MOTOR

Automation Direct

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GS/*DURAPULSE* Accessories – Ethernet Interface

Overview

The GS-EDRV Ethernet interface provides a high-performance Ethernet link between a control system and any GS or *DURAPULSE* AC drive. The GS-EDRV processes signals to and from the drive, mounts on a DIN rail, and connects the drive to an Ethernet hub or PC. It formats signals to conform with the Ethernet standard to the H2-ERM or H4-ERM, KEP*Direct* EBC I/O server (as shown on the following page), or independent controller with a Modbus TCP/IP driver. This allows for greater connectivity to many control system architectures.

An additional feature is the built-in web browser which allows users to configure and control the drive from any web browser via the IP address of the GS-EDRV card.

Note: The GS-EDRV requires an external 24 VDC power supply.

D2-260 with H2-ERM

GS-EDRV works with GS1, GS2, and GS3/*DURAPULSE* drives.

GS-EDRV

E-SW05U

GS-EDRV

DURAPULSE **Drive**

DURAPULSE **Drive**

Automatic power shut-down

The GS series drives have a provision for shutting down control or power to the inverter in the event of a communications time-out. This function can be set up through the drive parameter group 9.

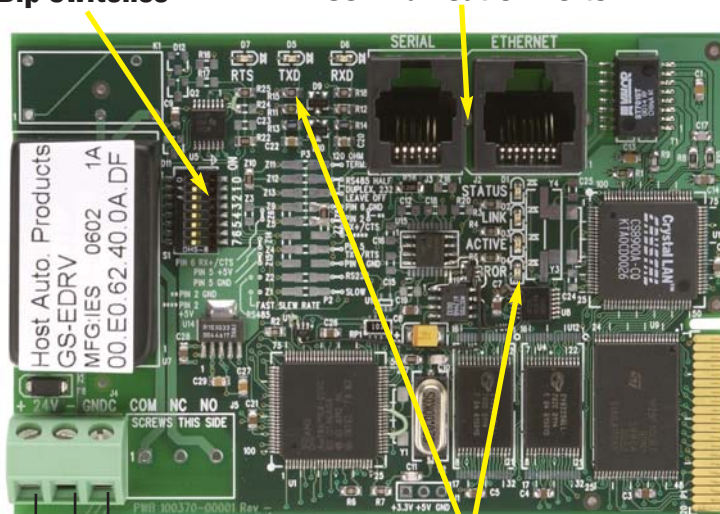| Specifications	
Part Number	**GS-EDRV**
Input Voltage	10-33 VDC
Input Current	90-135 mA
Can be used with all series GS/DURAPULSE AC drives	
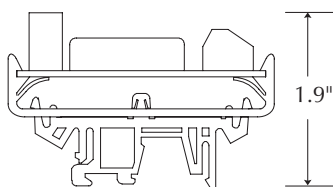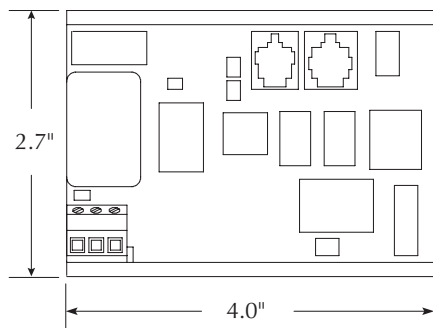
Dip Switches

Communication Ports

LED Indicators

Power Terminals
Chassis or system ground connection
Negative connection (-) or 0VDC
Positive connection (+) or +24 VDC

Dimensions

2.7"

4.0"

1.9"

units: inches

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GS/*DURAPULSE* Accessories – Software

KEP*Direct* I/O Server Overview

The KEP*Direct* EBC I/O server software is a 32-bit application that provides a way to connect your favorite Windows client software to AUTOMATIONDIRECT Ethernet I/O through our Ethernet base controllers. It provides GS/*DURAPULSE* series drive support via the GS-EDRV Ethernet interface, as shown in the diagram below. KEP*Direct* allows the user a direct line into the drive parameter group just like an Ethernet field I/O drop. The user can control or monitor from any OPC/DDE compliant third party software. For a complete description of KEP*Direct* software features, go to the Software section of this catalog. *Several application notes specific to the versatility of this software can be found on our web site at www.automationdirect.com.*

KEP*Direct* I/O Server Software

Part Number	Description	
PC-KEPEBC-3	Supports up to three GS-EDRV or EBC nodes	
PC-KEPEBC-7	Supports up to seven GS-EDRV or EBC nodes	
PC-KEPEBC-8P	Supports eight or more GS-EDRV or EBC nodes	
PC-KEPEBC-UPG	Upgrade to next larger package	

Can be used with all series GS/DURAPULSE AC drives; Requires GS-EDRV Ethernet interface.

CMMS and Condition Monitoring of Drives and Hardware Applications

Condition monitoring is usually the last part of CMMS (Computer Maintenance Management Software) implementation to be explored. It is expensive and difficult to use. Traditionally, the CMMS companies have used custom built data acquisition (DAQ) boards to monitor systems for values like vibration or temperature.

New technologies like KEP*Direct*, GS/*DURAPULSE* drives, and Terminator field I/O are perfect matches to allow the user to dispose of expensive proprietary DAQ boards. In addition to the cost savings, the intuitive set-up will reduce implementation.

These will become the standard tools that monitor control loop performance on-line and in real time. These tools enable continuous monitoring of control loops, and instant notification of operational deviations as they occur. Using OPC to tie these systems into CMMS provides tracking and automatic evaluation of your soft and hard assets. It also enables easy tracking of true operational and maintenance costs associated with those assets. Personnel can focus on fixing the cause of the problem, and not just the symptom.

Larger Scale Asset Management Applications

On a larger scale, such as Asset Management Software, there is too much information to directly link to the software (many of them are OPC/DDE compliant). There must be a buffer of some type. Usually this buffer is a SCADA type package that handles distribution of information gathered by condition monitoring field devices. KEP*Direct* and Terminator field I/O can connect as easily to the SCADA software as to any OPC compliant software.

Major OPC Clients supported

- Rockwell Software RSView32®
- GE's Cimplicity®
- Iconics' Genesis32®
- Cutler Hammer's PanelMate PC Pro
- Think & Do Live!
- Think & Do Studio
- Wonderware's In Touch® and OPCLink®
- Intellution's Fix Dynamics® and OPC Power Tool®
- Siemen's WinCC®
- Kepware's OPC QuickClient
- BizWareDirect's DataNet OPC

System Requirements

To run KEP*Direct* I/O Server, your PC must meet the following requirements:

- Pentium CPU, 400 Mhz clock speed
- Windows 98, NT 4.0 SP5, 2000 or XP
- 64 MB free RAM and 10 MB free hard disk space

KEP*Direct* I/O Server Software

GS-EDRV

E-SW05U

GS1, GS2, GS3/ *DURAPULSE* Drives
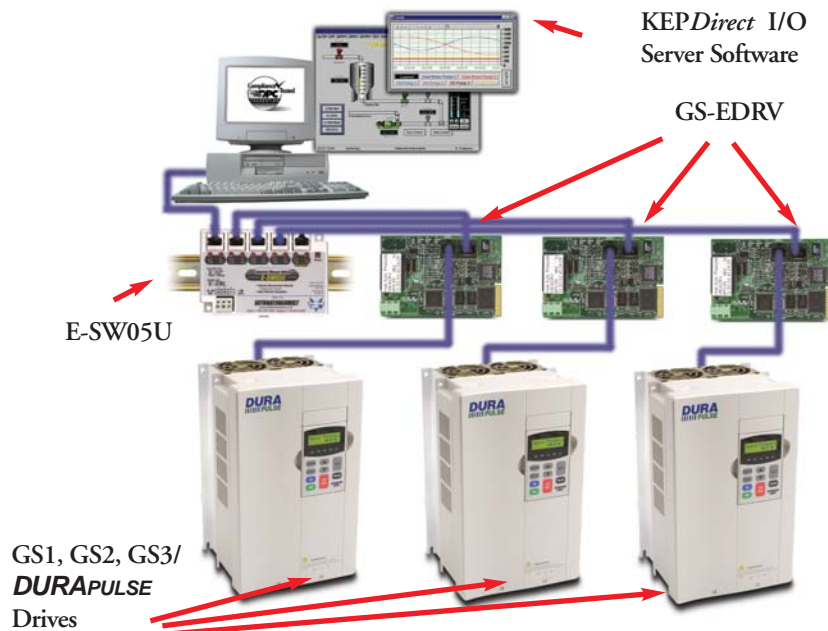
GS/*DURAPULSE* Accessories – Software

Overview

GSoft, the configuration software for the GS/*DURAPULSE* drives, allows a personal computer to be directly connected to the drives via RS-232 or RS-485 (RS-485 requires FA-ISOCON or user supplied converter). You can perform a variety of functions to allow easy, intuitive, and secure set-up of any application that is required using GSoft.

System Requirements

To run GSoft, your PC must meet the following requirements:

- Windows 95, 98, Me, NT, 2000 or XP
- Internet Explorer 4.0 or higher (for HTML help support)
- 24 Mb of available memory
- 8Mb hard drive space
- Available RS-232 serial port

Features

- Create new drive configurations using one of three views:
  - Quick Start - Allows for just the basic set-up to get quick and simple applications up and running ASAP.
  - Detailed - The complete set-up of all parameters in the drive.
  - Schematic Views - Set up the drive using the interactive schematic view. Create a printable cad-like drawing at the same time for future documentation and maintenance-friendly activities.

- Upload/download drive configurations.
- Edit drive configuration .
- Archive/store multiple drive configurations on your PC .
- Trend drive operation parameters in real time.
- Maintenance keypad will allow the user to commission the drive from the PC, check rotation, and run a basic cycle.
- Live PID tuning with active tuning control. Take the difficulty out of PID tuning with a real time trend.
- View drive faults.
- OPC client with KEP*Direct* EBC I/O server over the Ethernet with the GS-EDRV option card
- Have a large system with KEP*Direct* already being used to supply information to your SCADA system? Now program online with drive changes.

GS/*DURAPULSE* AC Drive Software

Part Number		Description
GSOFT		configuration software
GS-232CBL		RS-232 cable
FA-ISOCON		RS-232 to RS-422/485 converter with ANTE

Can be used with all series GS/DURAPULSE drives; FA-ISOCON required for GS1 and DURAPULSE drives.

## GSoft offers three software configuration methods

Detailed Configuration

The Detailed Configuration method provides AC drive parameter access in a tabbed dialog format. Detailed Configuration can be used for new or existing configurations.
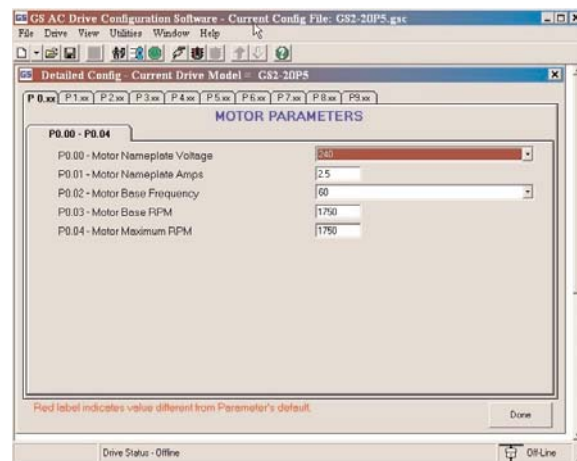
Schematic View Configuration

The Schematic View Configuration method uses a schematic picture of the AC drive and external connections to guide you through the setup of the AC drive. The Schematic View method can be used for new or existing configurations.
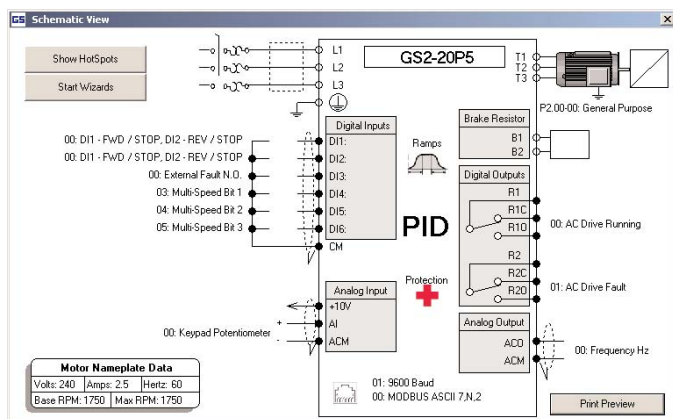
Quick Start Configuration

The Quick Start Configuration method guides you through the most commonly used AC drive parameters. Quick Start Configuration may ONLY be used to *create* a new configuration. Once created and saved, subsequent editing is done using the Detailed or Schematic View methods.

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